DEPARTMENT OF THE AIR FORCE
Headquarters Strategic Air Command
Offutt Air Force Base NE 68113

SAC REGULATION 55-5, VOL III

1 November 1979

Operations

AIRBORNE LAUNCH CONTROL SYSTEM (ALCS) TEST MISSIONS

This regulation establishes the policies and requirements for the conduct of ALCS test missions.

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CHAPTER 1
INTRODUCTION

1-1. GENERAL.

This regulation establishes requirements and procedures for ALCS test operations.

1-2. PRECEDENCE.

In the event of conflict between this regulation and other directives, contact HQ SAC/DOCAL for resolution.

1-3. RECOMMENDATIONS AND CHANGES.

Forward suggested changes to HQ SAC/DOCAL.

1-4. TERMS EXPLAINED:

ACCS	Airborne Command Control Squadron
ALCC	Airborne Launch Control Center
ALCS	Airborne Launch Control System
ATO	Airborne Test Operator
DMCCC-A	Deputy Missile Combat Crew Commander-Airborne
ERCS	Emergency Rocket Communications System
ETF	Engineering Test Facility
FOT&E	Follow-On Test and Evaluation
FTM	Flight Test Missile
GIANT MOON	ERCS OT&E Launch
GIANT PACE	SELM Test Mission
GLORY TRIP	Minuteman OT&E Launch
GTM	Ground Test Missile
HETF	Hill Engineering Test Facility
HF	High Frequency
IOT&E	Initial Operational Test and Evaluation
LCF	Launch Control Facility
LF	Launch Facility
LSC	Launch Support Center
LSS	Launch Support System
MCC-A	Missile Combat Crew-Airborne
MCCC-A	Missile Combat Crew Commander-Airborne
MCCM-A	Missile Combat Crew Member-Airborne
MLSO-A	Missile Launch Systems Operator-Airborne
OT	Operational Test
OT&E	Operational Test and Evaluation
PACCS	Post-Attack Command Control System
QOT&E	Qualification Operational Test and Evaluation
RO	Radio Operator
SELM	Simulated Electronic Launch-Minuteman

TC-A	Test Conductor-Airborne
UHF	Ultra High Frequency
VAFB	Vandenberg Air Force Base
VKA	Volatile Keying Assembly
WSMC	Western Space and Missile Center

1-5. SECURITY AND NUCLEAR SAFETY:

a. Normal security procedures apply. AFR 207-3, as supplemented prescribes security measures for ALCS aircraft. The MCCC-A is responsible for the security of all ALCS components and associated classified material.

b. SACRs 55-14, volume III and 55-56, volume I prescribe code handling procedures.

(1) The TC-A will ensure that no operational S-tapes, exercise tapes, or VKAs will be aboard the aircraft during the test.

(2) DOMC will mark test S-tapes with the test cryptovariable identifier and mission nickname (for example, "GIANT PACE 78-1"). Mark test VKAs "USE FOR ALCS TEST MISSIONS ONLY." The cryptovariable identifier of the test VKAs must match that of the test S-tapes and test exercise tapes.

c. AFR 122-32 prescribes weapon system safety rules. AFR 122-21 precribes weapon system safety for SELM missions and DOMV will insure that 1 STRAD/TEY writes the test sequence document in consonance with those rules.

d. SACR 122-2, volume V prescribes SAC two-man policy requirements and identifies the control of, and protection for, ALCS critical components.

CHAPTER 2

PURPOSE AND DESCRIPTION OF ALCS TEST MISSIONS

2-1. PURPOSE.

The primary purpose of ALCS test missions is to provide data to assess the reliability of the ALCS as an integral part of the Minuteman weapon system. Subsidiary purposes are to analyze and rectify equipment deficiencies; to verify the proper operation of the system after hardware, software, or procedural changes; and to provide baseline data with which changes can be compared.

2-2. DESCRIPTION.

Several types of ALCS test missions exist.

a. GLORY TRIP missions are OT&E launches from VAFB. See SAC Operations Order 99-FY.

b. GIANT MOON missions are OT&E launches from VAFB which include ERCS testing. See SAC Operations Plan 33-FY.

c. GIANT PACE (SELM) missions are conducted at operational units to assess the reliability of the weapon system in its various configurations. Missile launch is simulated using the actual operational ground equipment. See SAC Operations Order 143-FY and AFR 122-21.

d. HETF missions are conducted at Ogden Air Logistics Center (OO-ALC), Hill AFB UT. GTMs are used in HETFs I and II. Computer simulation is used instead of a GTM in the ETF. See OO-ALC test directive 5TT999L.

e. IOT&E /QOT&E missions are conducted at VAFB using operationally representative LFs, LCFs, and FTMs /GTMs. Squadron computer simulation is available.

f. Other test missions are performed as required. The specific details are provided in the implementing fragmentary orders or test sequence documents.

CHAPTER 3
TASKS

3-1. HEADQUARTERS SAC:

a. XOBML will

(1) Participate in the planning and preparation of test missions, to include no-notice missions, to ensure the adequacy of test data for reliability assessment.

(2) Analyze all test data to determine weapon system reliability.

b. DOCA will

(1) Publish fragmentary orders for HETF missions, and ALCS information messages for GIANT PACE and other missions as necessary.

(2) Coordinate with DOMC, DOMV, DOCC, DCOR, XPQO, and OO-ALC/MMETT, as appropriate, to schedule the missions and to assist in planning and preparing for the tests.

(3) Coordinate with XOBML, LGMA, and the agencies listed in paragraph(2), above, to assess test results.

(4) Provide personnel for missions flown by 2 ACCS, if required.

(5) Provide one officer from the ALCS Operations Branch to serve as the ALCS representative in the HQ SAC command post for each GLORY TRIP and GIANT MOON launch.

(6) Not later than 48 hours before scheduled takeoff time for any GIANT MOON/GLORY TRIP mission, transmit a priority message which includes the following information:

(a) Mission nickname.

(b) On-station time.

(c) Launch window.

(d) LF address and frequency, and ERCS address for GIANT MOON mission.

(e) Orbit area to be used.

(7) The message specified in paragraph (6), above, will be addressed as follows:

(a) Action. Applicable aircraft wing/DO/MA/DOC/DOTS.

(b) Information:

[1] Applicable AMS/MAAQ.

[2] Applicable ACCS/CC/DOA/DOC/DOF/DOK.

[3] 1STRAD/TEY/DOC.

[4] 15AF/DO/LGM.

[5] 4AD/DO/LGM.

[6] HQ SAC/DOMV.

[7] WSMC/ROO.

c. LGMA will analyze test results to determine system and equipment deficiencies.

d. DCOR will assist in the planning, preparation, and analysis of tests of interest to the communications community.

e. XPQO will manage the planning, preparation, and analysis of IOT&E/QOT&E missions associated with XPQO's development programs.

f. DOMV will

(1) Publish fragmentary orders for GLORY TRIP, GIANT MOON, GIANT PACE, and field test FOT&E missions.

(2) Direct the planning and preparation of GLORY TRIP, GIANT MOON, GIANT PACE, and deployment FOT&E missions.

(3) Assist in the analysis of tests other than HETF.

g. DOCC will assist in the planning, preparation, and analysis of GIANT MOON missions.

h. DOMC will provide test code materials as required.

3-2. FIFTEENTH AIR FORCE.

Fifteenth Air Force, through 28 BMW and 55 SRW, will

a. Provide aircraft to support this program.

b. Provide personnel, operations, and maintenance support for the aircraft and systems used in the program.

c. Provide test coordinators for GIANT PACE missions if required by HQ SAC/DOCA. See paragraph 4-4.

3-3. 1st STRATEGIC AEROSPACE DIVISION (1 STRAD).

1 STRAD/TEY will (for VAFB missions)

a. Coordinate ALCS launch activities and procedures with the participating ACCS, to include providing test initiation message formats and check lists, on-station time, sequence of events, launch window, LF address, and ERCS address for ALCS ERCS message insertion.

b. Develop ALCS orbit patterns in coordination with WSMC.

3-4. 392 COMMUNICATIONS GROUP (392 CG).

392 CG will (for VAFB missions) assure, through WSMC, that adequate ALCS-to-ground communications circuits exist safely to support this program.

3-5. OGDEN AIR LOGISTICS CENTER.

OO-ALC/MMETT will assist in the planning and preparation, and conduct of HETF missions; analyze HETF mission data and disseminate those data, as required.

CHAPTER 4

MISSILE COMBAT CREW - AIRBORNE (MCC-A) OPERATIONS

4-1. MCCs-A:

a. A complete MCC-A is required for each test mission.

b. GLORY TRIP, GIANT MOON and GIANT PACE missions require combat-ready MCCMs-A. Student MCCMs-A are permissible for other test missions if they are continuously supervised on a one-on-one basis by instructor or evaluator MCCMs-A.

c. The MCCC-A is responsible to the TC-A.

4-2. TCs-A:

a. Only combat-ready MCCMs-A may be qualified as test conductors-airborne. Select the most experienced and best technically qualified personnel available.

b. Each TC-A will be supervised by a fully-qualified TC-A on his/her first mission of each of the following types:

(1) GLORY TRIP/GIANT MOON/VAFB IOT&E/QOT&E mission (qualification in one qualifies for all).

(2) GIANT PACE/HETF (qualification in one qualifies for both).

c. Document qualification on SAC Form 203, Missile Qualification Record.

d. The TC-A is responsible for weapon system operation, successful mission accomplishment, and for pre- and post-mission reporting. The TC-A is responsible to the aircrew commander for all matters relating to safety of flight.

4-3. SAFETY CONDUCTORS:

a. A safety conductor is required for each GIANT PACE mission and must be an experienced, combat-ready MCCM-A. No training or documentation is required other than that prescribed by chapter 7.

b. The functions of the safety conductor are to assure, with the TC-A and the MCC-A, that no operational code components are carried aboard the test aircraft, that only the proper commands are transmitted, and to assist the TC-A, as required.

4-4. GIANT PACE TEST COORDINATOR.

The GIANT PACE test coordinator will be a an officer from HQ SAC/DOCAL or a highly-qualified, widely-experienced MCCM-A from 2/4 ACCS whose function is to serve as liaison between the TC-A and the ground test conductor on airborne test day.

4-5. WEAPON SYSTEM OPERATION:

a. Operate the weapon system in accordance with TO 21M-LGM30F-1-7, AFR 122-32, and any special safety rules applicable to the test.

b. Normally, transmit commands on direction of the ground test conductor. Deviation from the norm requires prior coordination.

c. Transmit all commands long enough to confirm message quality and signal strength (e.g., step 13 of the PLCA check list) or for the minimum transmission period, whichever is longer, unless specifically directed to do otherwise.

d. Use the best available transmitter, as determined by the communications team.

4-6. TEST PROCEDURES:

a. The TC-A will immediately advise the ground test conductor of any factors which could delay or prevent mission accomplishment.

b. The TC-A will coordinate closely with the flight crew to monitor remaining time on station and any other factors which could affect mission accomplishment.

c. 1st STRAD/DOC will broadcast execution messages for GLORY TRIP and GIANT MOON missile launches to the ALCC crew.

CHAPTER 5
AIR OPERATIONS

5-1. SAFETY OF FLIGHT.

Safety of flight is the primary consideration in all air operations conducted in support of this volume.

5-2. FLIGHT CONDITIONS.

The desired altitude for test operations is FL 330. If deviation is required, a higher altitude is preferred. During periods of command transmission, straight and level flight is desirable; bank angles of 15 degrees or less are acceptable.

5-3. ORBITS/OPERATING AREAS. (Subject to modification by fragmentary order or test sequence document):

a. Vandenberg AFB:

(1) Orbit Pattern A:	35-16N	121-32W
	34-55N	122-40W
	35-23.5N	122-52.5W
	35-45N	121-46.5W
(2) Orbit Pattern B:	34-22N	120-56W
	34-01N	122-04W
	34-29N	122-16W
	34-50N	121-08W

(3) The orbit may be changed at the direction of Frontier Control, the WSMC tracking and control operator.

NOTE: Frontier Control is unmanned before T-3:00 hours.

b. HETF: ROUND-ROBIN shuttle between the Salt Lake City and Burley VORTACs.

c. For any other mission: As directed by the fragmentary order or test sequence document.

5-4. RESPONSIBILITIES.

Test operations take precedence over unit training requirements. The TC-A is responsible for successful mission accomplishment. The aircraft commander remains the final authority on all decisions relating to safety of flight.

5-5. AIRCRAFT.

Provide no extraordinary equipment or preparation for aircraft flown in support of this volume other than as directed by the fragmentary order or test sequence document.

5-6. ALLOCATION OF MISSIONS.

Units will attempt to allocate test missions equally among all assigned aircraft.

5-7. NO-NOTICE MISSIONS.

Sterilize upon selection any alert aircraft selected by HQ SAC/XOBML for no-notice participation in test missions. That is, perform no maintenance and no equipment or crew change without approval of the XOBML team chief. (Exceptions: Perform maintenance on systems essential to safety of flight. Download operational code components and perform an upload using test code components.)

5-8. FLIGHT PLANS/ALTREVS.

The tasked unit is responsible for filing all flight plans and altitude reservations (ALTREV) required in support of this volume.

5-9. FLYAWAY TESTS.

On certain test missions, one test objective is to determine the maximum range of the ALCC-to-LF data link. During the flyaway portions of such missions, the navigator must plot the aircraft track on a separate aeronautical chart and mark the aircraft location at the times specified by the TC-A. This can best be done by making a tick on the track and annotating the ZULU time beside it. No other annotations are required because the time can be used to cross-reference other data sheets.

5-10. PASSANGER APPROVAL AUTHORITY.

HQ SAC/DOCA has the authority to authorize military, DOD civilian, and contractor personnel to fly on ALCS training and test missions.

CHAPTER 6
COMMUNICATIONS

6-1. COMMUNICATIONS TEAM:

a. The minimum communications team is two ROs (one of whom must be a fully-qualified RO-1) and one fully-qualified radio maintenance technician.

b. The requirements of paragraph 4-2b and 4-2c, this volume, apply to the RO-1.

6-2. DATA FREQUENCIES:

a. VAFB and operational units: See TO 21M-LGM30F-1-7 or SACR 100-7.

b. HETF I (WS-133A-M/CDB and ILCS/494L): 266.05 MHZ/FM.

c. HETF II (WS-133B/CDB): 272.00 MHZ/FM.

d. ETF (WS-133A-M): 266.05 MHZ/FM.

6-3. ALCC-TO-RELAY DATA FREQUENCIES:

a. VAFB: 323.80 MHZ/FM primary; 375.00 MHZ/FM secondary.

b. Other: See the PACCS frequency plan published by HQ SAC/DCOR.

6-4. VOICE COMMUNICATIONS FREQUENCIES:

a. Operational unit command posts and LCCs: See SACR 55-45, volume VI.

b. HETF:

(1) HF: 15.035 MHZ/USB primary; 23.385 MHZ/USB secondary.

(2) UHF: 337.6 MHZ/AM primary; 327.4 MHZ/AM secondary.

c. VAFB:

(1) 1st STRAD command post: 311.0 MHZ/AM primary; 321.0 MHZ/AM secondary.

(2) LCCs: 321.0 MHZ/AM.

(3) ATO net establishment frequencies: 5.700 and 13.218 MHZ.

(4) ALCC-to-relay FDM link frequencies: 280.05 and 315.15 MHZ/FM.

(5) Countdown net (monitor only): 351.3 MHZ/AM.

(6) FRONTIER CONTROL: 296.5 and 386.6 MHZ/AM.

(7) PLEAD CONTROL: 280.7 MHZ/AM.

d. HF frequencies for use during special tests at operational bases (upper sideband except as marked):

FREQUENCIES (KHZ)	DESIGNATORS
3295	AM
4495	E
5026	F
6826	G
9057	P
11494	L
11610L	H
13907	AC
15962	I
17617	N
18046	J
18594	Z
20890	D

6-5. CALL SIGNS:

a. HETF Test Conductor: HILL TEST.

b. VAFB:

(1) Range communications control center: ABNORMAL 10.

(2) WSMC tracking and control operator: FRONTIER CONTROL.

(3) Launch director: LAUNCH DIRECTOR.

(4) Test conductor: TEST CONDUCTOR.

(5) Launch support center (VAFB LSC): AFKAI-1 Block/Line I044-7.

(6) Pacific Missile Test Center Tracking and Control operator: PLEAD CONTROL.

c. ALCC:

(1) Flight crew: Tactical call sign.

(2) MCC-A and TC-A:

(a) 2 ACCS: AFKAI-1, Block/Line I044-9.

(b) 4 ACCS: AFKAI-1, Block/Line I044-8.

d. Operational units: Tactical call sign.

6-6. PROCEDURES:

a. HETF. Establish voice contact with HILL TEST not later than 15 minutes before the ETA to the orbit.

b. GIANT PACE and FOT&E. Establish voice contact with the missile unit command post as soon as possible after takeoff.

c. VAFB Missions.

(1) Complete transmitter verification as soon as possible after takeoff and before entering orbit area. Perform no maintenance on ALCS and RF equipment after an unsuccessful launch attempt until the cause of failure is determined.

(2) HF contact (ATO net) between the aircraft radio operator and range communications control center and launch support center:

(a) As soon as practical after takeoff, attempt contact with ABNORMAL 10, using frequencies given above.

(b) After establishing contact, the radio operator will request HF frequencies to be used for ATO net operation. ABNORMAL 10 will designate HF frequencies to monitor and check for best operation.

(c) Establish the ATO net using the best frequencies available as determined by monitor and voice checks. ATO net operation is HF duplex.

(d) Following ATO net establishment, the launch support center will be patched in. Anytime difficulty is encountered on the ATO net, the radio operator will return to the primary guard frequency (paragraph 6-4c(3)) and coordinate for ATO net re-establishment.

(e) If unable to contact the range communications control center on HF, attempt contact with FRONTIER CONTROL on frequency given above. NOTE: FRONTIER CONTROL is not manned prior to T-3 hours.

(f) If unable to establish contact with either of above agencies, attempt contact with PLEAD CONTROL.

(g) Following the establishment of ATO net, establish contact at least every 5 minutes. If unsuccessful, follow procedures in paragraph (d), above.

(h) For GLORY TRIP/GIANT MOON missions, conduct a communications check with the 1 STRAD Command Post on 311.0 and 321.0 MHZ as soon as possible after arrival in the orbit area and at T-20 minutes.

CHAPTER 7
REPORTS

7-1. PRE-MISSION:

a. At least two duty days before scheduled takeoff time for each test mission, the TC-A will submit a priority message with the following information:

(1) Unit.

(2) Complete aircraft tail number.

(3) Aircraft call sign (confidential).

(4) TC-A call sign (confidential).

(5) Takeoff time.

(6) Name/grade of TC-A, MCCMs-A, and (if required) safety conductor.

b. Address the message to HQ SAC/DOCAL and:

(1) For GLORY TRIP/GIANT MOON missions: 1STRAD/TEY.

(2) For HETF missions: DIR MAT MGT HILL AFB UT/MMETT.

(3) For GIANT PACE missions: GIANT PACE test SMW/DO/MB (ATTENTION: GIANT PACE TEST CONDUCTOR).

(4) For IOT&E/QOT&E missions: 1STRAD/TEP.

(5) For any other mission: 1STRAD/TEY (if the test is at VAFB) or test SMW/DO/MB (ATTENTION: [NICKNAME] TEST CONDUCTOR) (if the test is at an operational unit).

7-2. POST-MISSION:

a. Notify HQ SAC/DOCAL of mission results immediately after test completion via landline (while airborne if possible).

b. Submit a record-copy report within two duty days after test completion. The following are the minimum report contents. Include items 1-4 for each command transmitted.

(1) Time and type of command transmitted.

(2) Aircraft position, altitude, attitude, and heading.

(3) Transmitter used and its db rating.

(4) Results of the command (nominal, null, etc.), including ERCS status and message playback quality, if applicable..

(5) Maps of flyaway tracks with points of command transmission identified by time (if directed by the fragmentary order or test sequence document).

(6) Range from the test LF for GLORY TRIP/GIANT MOON launches.

(7) In addition, include the information required by paragraph 7-1a, except for call signs. Include any pertinent remarks.

c. Address each record-copy report to HQ SAC/DOCAL/XOBML/LGMA. In addition, address the following:

(1) For GLORY TRIP/GIANT MOON missions: HQ SAC/DOMV; 1STRAD/TEY; HQ SAC/DOCC (for GIANT MOON missions only).

(2) For GIANT PACE missions: HQ SAC/DOMV; GIANT PACE test SMW/MB (ATTENTION: GIANT PACE TEST CONDUCTOR); 1STRAD/TEY.

(3) For IOT&E/QOT&E missions and special test: HQ SAC/XPQO/DCOR/DOMV (if appropriate); 1STRAD/TEP (for VAFB tests); test SMW/DO/MB (ATTENTION: TEST CONDUCTOR) (for tests at operational units).

(4) For HETF missions: DIR MAT MGT HILL AFB UT/MMETT.

d. Classify these reports only if absolutely necessary. Refer to the current MINUTEMAN and ERCS security classification guides.

e. HQ SAC/DOCAL will notify HQ USAF/Ops Center/XOOTS of the results of each GLORY TRIP/GIANT MOON test launch mission.



R. H. ELLIS
General, USAF
Commander in Chief

R. A. DELMAR, Colonel, USAF
Director of Administration

SUMMARY OF CHANGES

Obsolete office symbols have been corrected. Reporting and weapon system operation procedures have been clarified. Expanded guidance for air operations has been included.

DISTRIBUTION: X

Washington DC 20330
1 - HQ USAF/XOOTS

Vandenberg AFB CA 93437
1 - TRW Vandenberg

Norton AFB CA 92409
2 - SACSO

Los Angeles CA 90045
2 - SACSO
AF Unit Post Office

Kirtland AFB NM 87117
2 - Dir Nuclear Surety/SN

Kirtland AFB NM 87117
1 - SACLO

Kirtland AFB NM 87117
1 - AFWL/NSCM

McLean VA 22101
1 - Mitre Corporation
Westgage Research Park
1820 Dolly Madison Blvd

Washington DC 20305
1 - Defense Communications
Agency/CCTC

Andrews AFB MD 20331
3 - HQ AFSC/SDE

Wright-Patterson AFB OH 45433
3 - HQ AFLC/SGED

Norton AFB CA 92409
2 - Inspector General, USAF
1002 IG Gp

Bedford MA 01730
2 - ESD/ESN
L.G. Hanscom Field

Hill AFB UT 84056
DIR MAT MGT
2 - MMETT
2 - MMIRE
2 - AFCD/OLMA

Tinker AFB OK 73145
DIR MAT MGT
1 - MMC
1 - MMZ

Vandenberg AFB CA 93437
5 - 6595 ASTW/CC

Fort Meade MD 20775
2 - NSA/S83

Vandenberg AFB CA 93437
1 - 1369 Photo Sq/CC

2ACCS
Offutt AFB NE 68113
10 - DOA
1 - DOC
5 - DOK
2 - DOF

Los Angeles CA 90009
2 - FAA Western Rgn (AF Rep)
Apt Stn

Pt Mugu, CA 93041
2 - Comm Pacific Missile Test Cen

Vandenberg AFB CA 93437
2 - SAMTEC

HQ SAC
1 - IGWO
1 - DOCAO
1 - DOMC
1 - XPQO
1 - DOMV
1 - DOCC
1 - LGMA
1 - LGMAC
1 - DCOR
1 - XOBML

Maxwell AFB AL 36117
1 - AUL/LSE

March AFB CA 92508
1 - 15 AF/DOM

Ellsworth AFB SD 57706
4 ACCS
15 - DOA
1 - DOC
1 - DOK
2 - DOF

Vandenberg AFB CA 93437
1 STRAD
2 - TEY
2 - TEP

Norton AFB CA 92409
SAMSO
2 - MNNL
2 - MNNA

Kirtland AFB NM 87117
1 - AFTEC/TES

F. E. Warren AFB WY 82001
1 - 4 AD/DO

Vandenberg AFB CA 93437
1 - Det 41, AFLC/EN